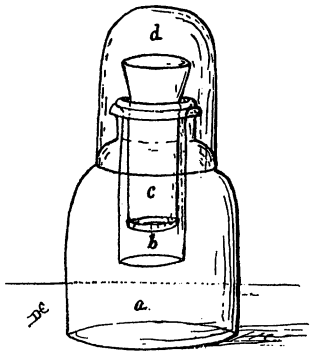
Schultze's dehydrating apparatus.—The accompanying figure shows a very convenient and simple arrangement for gradually dehydrating small objects. It consists of a wide-necked bottle (*a*), into whose neck is fitted a short tube (*b*), and within this a similar but smaller tube (*c*). In order to prevent these tubes from slipping down, the upper part is widened into a small funnel. Each of the tubes has the bottom closed by a piece of parchment paper, which is carefully gummed on. The object to be dehydrated is placed in the tube *c*, which is partly filled with weak alcohol (about 30 per cent.), and this is then placed in the tube *b*, which in turn is put into the neck of the bottle *a*, which has been filled with absolute alcohol. By the diffusion of the fluid through the membranes covering the bottom of the tubes *b* and *c*, the density of the fluids will finally become the same, and the object in *c* will thus gradually be brought into practically absolute alcohol. The cover, *d*, effectually prevents evaporation and at the same time keeps out dust.



DEHYDRATING APPARATUS.

In order to prevent the alcohol in *a* from becoming too much diluted, it is best to use a very small amount of the weak alcohol, and a little calcined copper sulphate placed in the bottom of the bottle will absorb what little water may be present.

Usually two or three hours is sufficient for completely dehydrating most objects, but naturally large ones may take longer. Of course the process may be expedited by covering the bottom of only one of the tubes with the membrane, but it is usually better to have the diffusion take place rather slowly.—DOUGLAS H. CAMPBELL, *Bloomington, Ind.*

CURRENT LITERATURE.

On Nematophyton and Allied Forms.[1]

Prof. Penhallow has presented in this short memoir a most valuable contribution to our knowledge of one of the oldest and most perplexing forms that has claimed the attention of paleobotanists. The original material was collected by Sir W. E. Logan, from the Erian sandstones of Gaspe, about 1852. It was first examined by Dr. (now Sir) William Dawson in 1855, who recognized at once the extreme interest attached to the

[1] PENHALLOW, D. P.—On Nematophyton and Allied Forms, from the Devonian of Gaspé, with introductory notes by Sir William Dawson. Trans. Roy. Soc. Canada. Vol. VI. Sect. IV, 1888, pp. 27-47. Pl. I, II.

discovery. After carefully studying the available material it was published by Dawson under the name of *Prototaxites Logani* with the following diagnosis: "Woody and branching trunks, with concentric rings of growth and medullary rays; cells of pleurenchyma not in regular lines, cylindrical, thick-walled, with a double series of spiral fibers; disks or bordered pores few, circular and indistinct. The specimens are usually silicified, with the bark in a coaly state." Although Dawson states in the notes accompanying Prof. Penhallow's paper that he did not intend to imply its coniferous nature, the fact that it was named *Prototaxites*, and compared with the Aporoxylon of Unger and with the wood of various conifers, was taken to imply its taxine nature, and it was for a long time regarded as one of the oldest ancestors of our modern conifers.

Carruthers was the next to take up the subject. He obtained similar material from the Silurian of Wales, and concluded from its examination that it was the trunk or stem of a gigantic sea-weed. He therefore named it Nematophycus.

It was with a view of settling, if possible, the question of its affinities, that the examination of Prof. Penhallow was undertaken, with the aid of a more extensive and perfect series of specimens. His results, which may be taken as final, fully confirm those of Carruthers. He says "that it is an alga admits of no doubt; and so far as the structure alone will permit a final decision, its affinity with the Laminariaceæ as first pointed out by Mr. Carruthers, who therefore assigned it to the genus Nematophycus, appears to be highly probable."

Dawson has accepted their conclusions, and in his recently published "Geological History of Plants" has modified the name to Nematophyton. The original species becomes N. Logani, and Prof. Penhallow has described a new species, N. laxum, from the lower Erian of Gaspe, which with the Wales species, N. Hicksii, makes up the present known forms.

Prof. Penhallow also describes some very peculiar laminated fossils associated with Nematophyton Logani. They have the appearance of being matted and crumpled masses apparently of fronds, and although the structure is very badly preserved, are fairly comparable to the fronds of the Laminarieæ. They may possibly have been the fronds of Nematophyton, but this is merely conjecture, as they were not found in actual contact.—F. H. K.

Die fossilen Pflanzenreste.[2]

Paleobotany has passed beyond the stage in which the entire body of its workers are devoting their energy to mere description of species, and has entered upon broader, philosophical grounds. That this is true, is shown by the publications of Williamson, Ettingshausen, Renault, Solms-Laubach, and now by the admirable résumé by Dr. Schenk. It is, of course, true that this broader view is only possible after the accumula-

[2] SCHENK, DR. A.—Die fossilen Pflanzenreste. Sonderdruck aus dem Handbuch der Botanik, Bd. IV. Breslau, Verlag von Edward Trewendt. 1888.

tions of data have been made by isolated, individual workers, but it is none the less true that these scattered facts require to be sifted through a philosophical mind before they can be presented as a connected whole. It is a connected view of this general character that the work before us furnishes.

This volume is taken from the magnificent Handbuch der Botanik that is being prepared under the supervision of Dr. Schenk by a number of noted specialists. It is really intended as an introduction to the study of paleobotany, but it also contains a very considerable amount of discriminative matter. In the short introduction he points out the value of the study of plant remains, not only to geology, but principally in regard to the light it throws upon the evolution of existing vegetation. The characters which can be most relied upon in the identification of fossil plants are next discussed. Only a comparatively few plants are so so preserved as to retain their internal structure in suitable condition for study, and for their characterization recourse must be had to marks that in living plants are usually overlooked or ignored. The most important character is that furnished by nervation. The ferns, for example, in which the fructification is not preserved, are arranged according to certain comparatively few types of nervation, which careful study has shown to be reasonably reliable. So, also, with dicotyledons and monocotyledons. Most of the genera can be as clearly identified by the outline and nervation of the leaves as they could be if the whole plant was accessible. The arrangement of cones, scales and leaves in the conifers furnishes a similar key to their positive determination. But, as Williamson long ago pointed out, the internal structure furnishes the most valuable of all data.

The methods or conditions under which plants become fossilized are next described. Incrustation, petrifaction, and the more or less complete change to coal are the three conditions. Then follows the main portion of the work, viz.: an exposition of our present knowledge concerning the various types of vegetation that have been found fossil, and the light thrown by them upon existing vegetation. Beginning with the fungi, for example, it is shown how the various types first appeared in time, and a brief discussion is given of the more important or critical forms. The algæ are similarly treated, especial stress being laid on many doubtful forms that are now under discussion by botanists and zoologists. From these lower forms, the types of vegetation occurring in a fossil state are passed in systematic review, coming ultimately to the higher forms which occur in the later geologic formations and are found both fossil and living at the present day.—F. H. K.

Minor Notices.

THE AUSTRALIAN FLORA has been carefully studied, and many good descriptive and illustrated works published, one of the latest of which is

a thick octavo on the useful indigenous plants, by J. H. Maiden,[3] curator of the Technological Museum of New South Wales. The plants are treated alphabetically under the following headings: Human foods, forage plants, drugs, gums and kinos, oils, perfumes, dyes, tans, timbers, fibers, and miscellaneous. The book is admirably arranged and contains a large amount of useful information, all authenticated by abundant references to sources of information. There are fifty double-column pages of indexes.

THE FIRST FASCICLE of twenty-five Kansas fungi has been distributed by Kellerman and Swingle, of Manhattan, Kansas. The object is to include species never before issued, or on new hosts, or because otherwise noteworthy. The specimens are ample, of excellent quality, and are neatly put up and labeled. The present fascicle contains four species of Cercospora, three of Puccinia, two each of Æcidium, Gloeosporium, Peronospora and Septoria, and one each of the ten remaining genera, all being parasitic forms. The series promises to be a valuable addition to American exsiccati. Those who are not so fortunate as to be remembered in the distribution can purchase of the authors at $1.25 per fascicle until the edition is exhausted.

NOTES AND NEWS.

MRS. LYDIA S. BENNETT, a well known botanist at Fisk University, Tenn., died March 16.

PROF. PETER, of the University of Göttingen, desires seeds of North American species of Hieracium.

MR. A. A. CROZIER has resigned his position as botanist of the Iowa Agricultural Experiment Station. His address at present is Ann Arbor, Mich.

THE LIBRARY of Leopold von Ranke, recently placed on the shelves of the Syracuse University, although mainly historical, yet contains some scientific serials of special value. The largest of these are the *Abhandlungen* of the Berlin Academy, 1788 to 1886, 81 quarto volumes; the *Sitzungsberichte* and *Monatsberichte* of the Academy of Sciences of Berlin, together making 44 volumes; the *Zeitschrift der Gesellschaft für Erdkunde* of Berlin, 1839 to 1885, in 52 volumes; the *Sitzungsberichte* of the Imperial Academy of Sciences at Vienna, 1848 to 1886, 113 octavo volumes, and the *Denkschriften* of the same Academy, in 35 royal quartos; the *Atti* of the Academy of Sciences at Turin, 1865 to 1886; the *Bulletin* and *Annuaire* of the Royal Academy of Belgium, the two series making 169 volumes; the long series of the *Jaarboek* of the Royal Netherland Institute; the *Verslagen* and *Verhandelingen* of the Royal Academy of Sciences at Amsterdam, and reports and memoirs of the scientific societies of Upsala, Copenhagen, St. Petersburg and Dublin. Altogether a fine reference collection of serials for the scientific workers of the institution and vicinity.

[3] MAIDEN, J. H.—The useful native plants of Australia, including Tasmania. pp. 696 8vo. Sydney and London: 1889.